Sowela Technical Community College

Master Course Outline

Course Name: Physical Science I
Course Number: PHSC 1000
Lecture contact hours: 45 **Lab contact hours:** 0
Semester Contact Hours: 45 **Semester Credit Hours:** 3

Catalog Description:
Introductory study of topics in physical science including motion, energy, temperature, light and sound, electricity, and atomic structure.

Prerequisites: MATH 1100 (College Algebra) is recommended
Co-requisites: None

Required Textbook and Supplies:
An Introduction to Physical Science, 11th edition, by Shipman, Wilson, and Todd, Brooks-Cole, 2006.
All students must have a scientific calculator.

Student Learning Outcomes:
Upon successful completion of this course, the student will be able to

- Use a basic scientific vocabulary that relates to the course content.
- Recognize and explain physical phenomena relevant to course content.
- Demonstrate a fundamental knowledge of basic laws and principles governing the nature of matter, motion, energy and simple machines, waves, and electricity and magnetism.
- Use mathematics to solve problems illustrating appropriate principles of physical science.
- Relate physical science principles to everyday life.

Assessment Measures:

Four instructor-designed unit exams	100 pts. each (drop lowest score)
In-class activities and homework assignments	100 points
Departmentalized, comprehensive final exam	100 points
Research paper	100 points
Quizzes	100 points
Total	700 points

Expanded Course Outline:

Measurement
- Scientific method
- Standard units and systems of units
- The SI or metric system
- Derived units and conversion
- Significant digits and scientific notation

Motion
- Defining motion
- Speed and velocity
- Acceleration
- Acceleration in uniform circular motion
- Projectile motion

Force and Motion
- Force
- Newton's laws of motion
- Momentum

Work and Energy
- Work
- Energy
- Power

Temperature and Heat
- Temperature
- Heat
- Heat transfer
- Phases of matter
- Kinetic theory

Waves
- Waves and energy propagation
- Properties of waves
- Electromagnetic waves
- Sound waves
- Doppler effect and resonance

Electricity and Magnetism
- Static and current electricity
- Voltage, current, power, and energy
- Magnetism
- Electromagnetism

Atomic Physics
- Atomic structure
- Duality of light
- Heisenburg's Uncertainty Principle

Nuclear Physics
- Radioactivity and half-life
- Nuclear reactions
- Fission and fusion
- Biological effects of radiation

Waves and Optics
- Reflection
- Refraction
- Spherical mirrors
- Lenses

Chemical Elements
- Classification of matter
- Discovery of elements
- Occurrence of elements
- Periodic table
- Naming compounds
- Groups of elements

Chemical Bonding
- Conservation of mass
- Definite proportions
- Dalton's atomic theory
- Ionic bonding
- Covalent bonding
- Hydrogen bonding

Chemical Reactions
- Balancing chemical reactions
- Energy and rate of reactions
- Acids and bases
- Single-replacement reactions
- Avogadro's number

Organic Chemistry
- Bonding in organic compounds
- Aromatic hydrocarbons
- Aliphatic hydrocarbons
- Derivatives of hydrocarbons
- Synthetic polymers